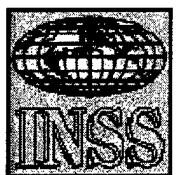


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Information & Nuclear RMAs Compared

by Martin C. Libicki

Conclusions:

- In many respects the current information-based Revolution in Military Affairs (RMA) echoes the earlier nuclear-based RMA. Both put conventional force structures at risk from more modern warfighting methods.
- Yet the Nuclear RMA did not make conventional forces obsolete. In the end, the nuclear RMA was unusable in a military context; thus conventional superiority reemerged as important. By contrast, the Information RMA--with its ability to support precision warfare--is eminently usable. Moreover, the entry fee for getting into the game is very low; innovations in warfighting may emerge from anywhere.
- Both RMAs were initially considered adjuncts to war. But the nuclear RMA transformed global politics (by reinforcing the bipolar stalemate). Might the Information RMA do so? A capability, for instance, to make the world transparent for one's own or other forces could alter the nature of presence, force projection, or coalition formation.

Parallels to the Nuclear RMA

It is difficult to return to the historic literature on nuclear strategy (e.g., Lawrence Freedman's, "The Evolution of Nuclear Strategy") without the eerie feeling that much of what is now predicted to result from the current information-based Revolution in Military Affairs (RMA) echoes predictions made a half-century earlier for an earlier RMA, based on nuclear weapons.

Theorists of the 1940s and 1950s who speculated on the impact of nuclear weapons on conventional forces were forced to conclude that most elements of the conventional forces were rendered suddenly obsolete. It was difficult to see what a surface Navy would do if complete ships, and even battle groups, could be vaporized by any nuclear weapon that landed near it. After launching an initial nuclear strike, airfields would become quickly useless. Ground forces, trained on the principle of concentration of force, would find such concentrations to be excellent targets for mass annihilation and therefore would have to disperse to survive--hence the (ill-fated) Pentomic divisions. Traditional military virtues necessary for unit cohesion and effectiveness would rapidly become irrelevant. In an era of "push-button" operations, where civilian strategists at places like RAND, rather than the military, were presumed to be at the leading edge of thought, it was not clear what purpose most of the military would serve anyway.

Yet 50 years later, the United States (and other nations as well) still possess surface ships, airfields, and ground divisions. Not only that, but virtually every platform has been modernized several times over in competition with enemies both real, and now, hypothesized.

What happened to yesterday's future? As Bernard Brodie had originally understood, it is difficult to imagine military operations with nuclear weapons that can lead to desirable outcomes in any traditional sense. From roughly 1960 on, the Services returned to the belief that conventional defense against the Soviets mattered because it might be sustained without resort to all-out nuclear warfare; preferably without resort to nuclear weapons whatsoever. If the United States abjured below some firebreak line--be it the conventional nuclear line or the tactical-strategic line--perhaps the Soviets would do the same. As Korea and Vietnam showed, U.S. forces and arms would also have to compete with forces with Soviet-supplied arms in scenarios that lacked credible nuclear options. Thankfully, whether two modern adversaries could clash short of Armageddon was never tested. The remaining technological competition gave birth to the current, Information RMA.

A few observations on the Information RMA are in order:

- The RMA is about precision weaponry linked with knowledge, and not knowledge per se. There is a world of difference, operationally, between knowing that an enemy column is sitting over the hill so that forces can be prepared, and knowing the latitude and longitude of every enemy tank to within the kill radius of one's weapons.
- Second, the RMA is nearly 20 years old. When William J. Perry argued, "[the United States is now] converging very rapidly [on the following three objectives] to be able to see all high-value targets on the battlefield at any time: to be able to make a direct hit on any target we can see, and to be able to destroy any target we can hit . . . [so as to] make the battlefield untenable for most modern forces," he was speaking in 1978.
- Third, if visibility equals death, then the nature of conventional warfare (as apart from strategic nuclear warfare or irregular conflict) shifts from force-on-force to hide-and-go-seek. For the United States, which has stand-off precision weaponry and some stealthy platforms, an increasing share of its operational art will be devoted to systems that seek. Admiral Owens refers to the combination of seeking, speaking, and shooting as his system-of-systems, but the seeking and speaking part can be better understood as a single, albeit distributed, Meta-System.
- Fourth, in contrast to earlier RMAs, such as the Nuclear RMA, or the Dreadnought RMA, the entry fee into the Information RMA is low. This holds true partially because the Information RMA has no bottom threshold, but largely because most of what goes into the Information RMA can be purchased for only thousands of dollars each in world markets. Imagine what a sophisticated middle income country could do with a few thousand French and/or Russian precision guided munitions (PGMs); a few hundred unmanned aerial vehicles (UAVs) (from any of 30 countries); digital videocameras; personal computers; cellular switches phones and pagers; GPS and pseudolite receivers; pocket radars; and night vision goggles; plus archived Powerscene maps combining purchased space imagery and topography, all integrated by a few hundred U.S. trained engineers--a Radio Shack System-of-Systems.

Does the United States have a long lead in the Information RMA? Unquestionably, and its advantages in very long range strike, space stealth, and exquisite systems integration should last a long while.

However, a country operating in or near its own backyard may not need long-range capabilities to nevertheless hold U.S. forces at bay. Many nations--potentially bucking for peer military status--already have global capabilities.

Conventional forces survived the Nuclear RMA because nuclear war was unfightable. But the Information RMA is eminently fightable and holds the prospect of conventional military victory without mutual suicide--indeed with even less collateral damage. However, most of what a nuclear war would have done to conventional forces can be applied to the Information RMA--but this time for real.

It is hard to see, for instance, what to do with ships; they are not hard to spot, and against a volley of supersonic cruise missiles, are difficult to keep afloat anywhere close to the littoral. Airfields, or any fixed facility for that matter, are unlikely to escape destruction in the face of PGMs that can be guided to precise latitudes and longitudes. Ground concentrations are also detectable, and so concentrating fires without concentrating forces has become Army mantra. Yet, even individual tanks are difficult to hide when they are moving.

With the U.S. public's sensitivity to casualties, any intervention à la Desert Storm, may be untenable against a sophisticated opponent. For this reason, the United States will have to adopt and perfect stand-off warfare. In so doing, the Meta-System--built up from sensors, emitters, networks, and processors designed to find everything worth engaging--will inform and maybe even actuate stand-off weaponry. In this fashion, conventional warfare will adopt many, if not necessarily all, of the characteristics of push-button warfare. War will also become more civilianized even if conventional military virtues retain their validity. Compare Bosnia and Haiti, to the Gulf, to Vietnam, and to Korea; civilians are increasingly in relative importance. As more of what counts about war is information gathering rather than applying firepower, then more of what counts about war can be outsourced; of note is how U.S. military consultants assisted Croatia as they reclaimed the Krajina last year.

Finally, 15 years into the nuclear RMA, theorists concluded the most important rule of nuclear strategy is to maintain an assured second-strike capability. Last month, Bernard Gray, writing in the London *Financial Times*, argued that in the Information RMA "a rapid and massive first strike to blind and disable the enemy could well prove effective . . . [so that] such speed will cause a real problem for political control of warfare . . . with politicians prisoners of their logic they must finish rapidly what they have started or be defeated." The first challenge of constructing the Meta-System is to make it sufficiently distributed and robust so that it can, in fact, survive a first strike and function, more or less intact afterwards.

Information RMA--Reality or Not?

Is the Information RMA a true revolution? A test of that hypothesis, developed by Dr. Daniel Gouré (of the Center for Strategic and International Studies), is whether a technical revolution has geostrategic ramifications. Those emanating from the Nuclear RMA are obvious; for over 40 years the United States and the Soviet Union were peers with a long gap to third place. The Cold War bifurcation was frozen in place as each learned not to impinge on the other's vital interests; the Soviet Union's collapse resulted from internal forces. Are the ramifications of the Information RMA enough to qualify the Information RMA as a true revolution?

The answer depends on how the Information RMA is packaged. If the United States uses the Information RMA to do Desert Storm, but more efficiently, the answer is no. Some nations would regard us with awe; others would redouble their efforts to make really ugly weaponry. However, inasmuch as the

essence of the RMA is expressed in a Meta-System capable of collecting, processing, storing, and transmitting militarily relevant information as need arises, then the United States has within its grasp a method by which it can assist its allies and influence military outcomes all over the world without really showing up.

The Meta-System Illuminates the Battlefield

What the Meta-System does is, in effect, to illuminate the conventional battlefield with bits of information. These bits can be converted into firing solutions for PGMs, or provide general help for all sorts of military operations (e.g., showing where the enemy is and is not). If the reach of the U.S. Meta-System is global, then all this information could be conveyed as bitstreams to our friends to multiply the effectiveness of their own forces. To put it bluntly, they provide the weapons and we provide the aimpoints. More generally, bitstreams can also be used to increase the usefulness of all information-dependent military systems, and provide simulation capabilities that may help others train their forces. In effect, the United States can use remotely delivered bitstreams to form virtual coalitions (although, in practice, some U.S. forces may have to be on hand for setup, hand-holding, and shakedowns).

How might virtual coalitions be used? Plugging Eastern European nations into our Meta-System may be a way to get their militaries up to speed, preparing them for potential NATO membership. In Asia, countries friendly with the United States nevertheless eye each other suspiciously; illuminating the region for them may increase their capacity for self-defense without provoking an arms race. Helping an ally (e.g., Turkey) can enable it to guard its own borders mitigating its need to march across them in pursuit of foes (e.g., PKK guerillas). If the United States had this capability, it could arrange for small countries such as Kuwait to carry more of the burden of their own defense; they would buy and hide anti-armor missiles and we would tell them precisely where enemy tanks were at all times. The imbalance in troubled regions could be righted where one side (e.g., Bosnia) faces a foe (e.g., Serbia) that has the tacit support of another power. Turned around, the Meta System can also illuminate demilitarized zones giving both parties instant information--easily convertible to prosecution--on transgressions. The political obstacles to such capability are non-trivial; but the technical prerequisites to a plug-and-play virtual coalition are, themselves, a second challenge of high order.

Yet, do even these new instruments of national power get the United States where it ought to be in the Information RMA? Early in the nuclear era, the possibility that nuclear weapons would fuel an expensive and potentially fatal arms race led the United States to propose the Baruch Plan to manage nuclear power. The effort failed in the wake of growing mutual suspicions between the United States and the USSR.

Is there a parallel for the Information RMA? In one sense the urgency is less; PGMs have far less likelihood of ending civilization. Yet, it seems as though the United States, in its unipolar moment, ought to be able to convert its temporary but very large advantage in the Information RMA into a more permanent force for ridding the world of conflict.

Without going into details, a sketch may suffice. Consider the Meta-System composed not only of a concatenation of U.S. sensors in space, air, sea, and land (with associated processors, knowledge bases, and user agents), but also the same constellation of sensors and nodes from allies, perhaps from third parties (e.g., commercial imagery satellites), and even those operating for civilian purposes such as environmental monitoring, transportation control, or public health. Merge them into a complete set of data streams available not only to the U.S. Armed Forces, but sufficiently stripped of sensitive data, to

any government, or even group, with sufficient need for such information. A Meta-System so constituted should be able to watch over the entire globe, constantly on the lookout for physical signs of activities that threaten the peace. Everyone would be looking, in effect, over everyone else's shoulder.

If other major powers buy into the system, in time they may learn the value of supporting it, and as they grow to trust it, they may very well come to rely on it as a growing substitute for their own systems. History suggests that tying nations together through world trade failed to stop wars; but wars are not governed by the shopkeepers. The Meta-System, by contrast, ties together those concerned about security--the very class paid to consider the whys and wherefores of armed conflict.

Will such an arrangement stop all wars? By no means. But if it can inhibit the mobilization and deployments prefatory to certain wars, particularly among major powers, it may very well be worth the try. If "history" can be defined as nation-state conflict, particularly among the major powers, the Meta-System may very well postpone its return--making the third challenge, opening up the Meta-System without losing control over it, worthwhile.

What is a Meta-System?

The Meta-System is Admiral Owen's System-of-Systems (see Strategic Forum #63) integrated with enough connectivity and software so that any authorized user, anywhere, can acquire fuzed, near real-time battlespace information of any point, parameter, or subject area.

These remarks were delivered before the Senior Military Conference at the U.S. Military Academy on 7 June 1996. Dr. Martin C. Libicki is a Senior Fellow with INSS's Center for Advanced Concepts and Technology. He can be reached at 202-685-3837 x 521, (fax) 202-685-3664, or e-mail at libickim@ndu.edu. NOTE

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